IN THE CLAIMS

Please cancel claims 14-20.

Please add new claims 21-55 as follows:

--21. A thin film electrochemical product manufactured according to the method, comprising:

molding a near net shape ceramic element including a planar base region and a plurality of tubular regions;

infiltrating the planar base region with a dense non-conductive material;

infiltrating each of the tubular regions with a porous conductive material;

applying a porous catalytic electrode material onto the infiltrated regions to form one of a cathodic and anodic surface;

depositing a ceramic electrolyte coating onto the porous catalytic electrode material;

applying a porous catalytic electrode material onto the deposited ceramic electrolyte coating; and

depositing a porous conductive material onto the porous catalytic electrode.

22. The product of claim 21, comprising:

subjecting the near net shape ceramic element to binder removal and sintering procedures.

23. The product of claim 21, wherein the porous conductive material has a concentration in a range between 30-50%.

24. The product of claim 21, further comprising forming electrically conductive vias to electrically connect a deposited porous conductive material on one of the tubular regions to an adjacent infiltrated region of another of the tubular regions.

25. The product of claim 24, comprising depositing a porous conductive material onto an infiltrated region and onto a portion of the planar base region.

26. The product of claim 25, comprising forming electrically conductive vias to electrically connect an infiltrated region of one of the tubular regions to an adjacent deposited porous conductive material of another of the tubular regions.

27. The product of claim 21, wherein the porous catalytic electrode material is deposited on an outer surface of each of the tubular regions.

28. A thin film electrochemical product manufactured according to the method, comprising:

molding a near net shape ceramic element including a base region and a plurality of tubular regions;

masking a portion of each of the base regions to form a first base region an a second base region;

depositing a porous conductive material onto the plurality of

tubular regions and the first and the second base regions;

first applying a porous catalytic electrode material onto the deposited porous conductive material to form one of a cathodic and anodic surface;

depositing a dense ceramic electrolyte onto the applied catalytic electrode material;

second applying a porous catalytic electrode material onto the deposited ceramic electrolyte to form the other one of the cathodic and anodic surface; and

depositing a porous conductive material onto the porous catalytic electrode to electrically connect the second applied catalytic electrode over the first base region to the porous conductive material on the second base region.

29. The product of claim 28, comprising:

subjecting the near net shape ceramic element to binder removal and sintering procedures.

30. The product of claim 29, wherein the base region includes a separate portion onto which the masking is applied.

31. The product of claim 28, further comprising hermetically sealing the second electrode over the second base region from the porous conductive material on the second base region.

32. The product of claim 28, comprising removing the masking

between the second electrode over the second base region and the porous conductive material on the second base region.

33. The product of claim 28, comprising infiltrating the base region with a dense non-conductive material.

34. A thin film electrochemical apparatus, comprising:

a ceramic support structure including a non-electrolytic region and a plurality of electrolytic regions separated by said non-electrolytic region;

said non-electrolytic region being electrically non-conductive and providing an hermetic barrier;

a first catalytic electrode layer formed on a surface of each of said electrolytic regions;

an electrolyte layer adjacent to said first catalytic electrode layer;

a second catalytic electrode layer adjacent to said electrolytic layer.

35. The thin film electrochemical apparatus of claim 34, wherein said ceramic support structure is made of aluminum oxide.

36. The thin film electrochemical apparatus of claim 34, wherein said electrically conductive region is approximately one-third electrically conductive material, one-third pores and one-third insulative material.

37. The thin film electrochemical apparatus of claim 34, wherein the catalytic electrode is Ln_{1-x} A_x BO_3 where Ln is a lanthanide ion or mixture of such ions, A is Ca, Sr or Ba and B is one or more transition metal ions including one or more of Cr, Mn, Co and Ni.

38. The thin film electrochemical apparatus of claim 34, wherein said electrolytic layer is 95% of theoretical density.

39. The thin film electrochemical apparatus of claim 34, further comprising forming a plurality of electrically conductive vias in the planar base region.

40. The thin film electrochemical apparatus of claim 34, wherein the electrically conductive region is approximately 50μm thick.

41. A method of manufacturing a thin film electrochemical apparatus, comprising:

molding a near net shape ceramic element including a non-electrolytic region and a plurality of electrolytic regions;

infiltrating the non-electrolytic region with a dense non-conductive material;

infiltrating each of the electrolytic regions with a porous conductive material;

applying a porous catalytic electrode material onto the infiltrated regions to form one of a cathodic and anodic surface;

depositing a ceramic electrolyte coating onto the porous catalytic electrode material;

applying a porous catalytic electrode material onto the deposited ceramic electrolyte coating; and

depositing a porous conductive material onto the porous catalytic electrode.

42. The method of claim 41, comprising:

subjecting the near net shape ceramic element to binder removal and sintering procedures.

43. The method of claim 41, wherein the porous conductive material has a concentration in a range between 30-50%.

44. The method of claim 41, further comprising forming electrically conductive vias to electrically connect a deposited porous conductive material on one of the tubular regions to an adjacent infiltrated region of another of the tubular regions.

45. The method of claim 41, wherein the non-electrolytic region is a planar base region and the electrolytic regions are tubular regions.

46. The method of claim 44, comprising depositing a porous

conductive material onto an infiltrated region and onto a portion of the planar base region.

47. The method of claim 46, comprising forming electrically conductive vias to electrically connect an infiltrated region of one of the tubular regions to an adjacent deposited porous conductive material of another of the tubular regions.

48. The method of claim 41, wherein the porous catalytic electrode material is deposited on an outer surface of each of the tubular regions.

49. A method of manufacturing a thin film electrochemical apparatus, comprising:

molding a near net shape ceramic element including a non-electrolytic region and a plurality of electrolytic regions;

masking a portion of each of the non-electrolytic regions to form a first non-electrolytic region and a second non-electrolytic region;

depositing a porous conductive material onto the plurality of electrolytic regions and the first and the second non-electrolytic regions;

first applying a porous catalytic electrode material onto the deposited porous conductive material to form one of a cathodic and anodic surface;

depositing a dense ceramic electrolyte onto the applied

catalytic electrode material;

second applying a porous catalytic electrode material onto the deposited ceramic electrolyte to form the other one of the cathodic and anodic surface; and

depositing a porous conductive material onto the porous catalytic electrode to electrically connect the second applied catalytic electrode over the first non-electrolytic region to the porous conductive material on the second non-electrolytic region.

50. The method of claim 49, comprising:

subjecting the near net shape ceramic element to binder removal and sintering procedures.

51. The method of claim 50, wherein the non-electrolytic region includes a separate portion onto which the masking is applied.

52. The method of claim 49, further comprising hermetically sealing the second electrode over the second non-electrolytic region from the porous conductive material on the second non-electrolytic region.

53. The method of claim 49, comprising removing the masking between the second electrode over the second non-electrolytic region and the porous conductive material on the second non-electrolytic region.

54. The method of claim 49, comprising infiltrating the non-electrolytic region with a dense non-conductive material.

55. The method of claim 42, wherein the non-electrolytic region is a planar base region and the electrolytic regions are tubular regions.--